SITE HAZARD ASSESSMENT
WORKSHEET 1
Summary Score Sheet

SITE INFORMATION:

Name: LOTT Construction Project ROW Martin Way
Address: 6100 Block of Martin Way E, Lacey, WA 98516
Section/Township/Range: S15/T18N/R1W
Latitude/Longitude: 47.05020, -122.80159
Parcel Number: N/A (Just north of #11815230900)
Ecology FSID: 16611
Date Scored: May 28, 2015

Site assessed/ranked for the August 2015 update.

SITE DESCRIPTION:

This site is located on the north side of the 6100 block of Martin Way East in Lacey, WA between Desmond Drive and Carpenter Road SE in the public right-of-way (ROW) associated with the road system owned by the City of Lacey. It is directly across from the LOTT Wastewater Alliance Wastewater Treatment Plant (6121 Martin Way, Parcel 11815230900), and bordering the Nisqually Trout Farm (5780 Martin Way E, Parcel 11815220400) in an area of light commercial and residential properties. This area slopes northwest to Woodland Creek, which is located approximately 500 feet away. The Nisqually Trout Farm's holding ponds are roughly 500 feet to the north of this site. Soils in adjacent parcels include very gravelly sandy loam, silt loam, and fine sandy loam. Depth to groundwater on this site is unknown, but the shallower WSDOT resource protection wells in the area are around 20 feet in depth.

PREVIOUS INVESTIGATIONS:

In August of 2005, a portion of the LOTT Wastewater Alliance's conveyance line was installed along Martin Way East as part of a sewer upgrade project. During excavation activities, a contractor discovered petroleum contaminated soils at roughly 10 feet below ground surface (bgs). The contamination was then reported to the Washington State Department of Ecology (Ecology) and added to their ERTS database (#55092).

On August 17, 2005, GeoTechnical Testing Laboratory (GeoTechnical) submitted a single sample of contaminated soil to the Libby Environmental Laboratory using NWTPH-Dx/Dx Extended. Results indicated that 1,100mg/kg of diesel range total petroleum hydrocarbons (TPH-D) was present. This was stated to be above the 1,000 mg/kg MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses (MTCA Cleanup Levels). This level is now currently at 2,000 mg/kg for TPH-D. Stemen Environmental, who was contracted to remove the accessible contaminated soils from the excavation area, collected three samples (SP-1, 2, and 3) from the initial stockpiled materials for analysis to ESN Northwest Laboratory (ESN). Lab results indicated that TPH-D concentrations did not exceed MTCA Cleanup Levels. This stockpiled material was transported to the Olympic View Transfer Station in Port Orchard, WA before disposal at the Columbia Ridge Landfill in Arlington, OR by Waste Management, Inc.

On August 31 and September 1 of the same year, Stemen Environmental continued to remove additional contaminated soils from the site. These soils were loaded directly into trucks and also deposited at the Olympic View Transfer Station before being disposed of at the Columbia Ridge Landfill. During these two days, an additional soil sample was collected (SSW) and analyzed by ESN which confirmed the presence of TPH-D above MTCA Cleanup Levels. This lab result also stated that the analysis indicated that the contamination was from diesel and heavy oil range hydrocarbons, possibly bunker C.

In total, 176 tons of petroleum contaminated soils were excavated, removed, loaded, and transported from this site. When final excavation limits were reached, two discrete soil samples were collected from the pit's floor. FS-12 was obtained from 12 feet bgs on the eastern side of the excavation and FS-13 was obtained from 13 feet bgs on the western side of the excavation. Sample results did not detect any TPH-D, heavy oil range total petroleum hydrocarbons (TPH-O), and mineral oil range total petroleum hydrocarbons (TPH-mineral oil). Due to the presence of trench boxes and shoring materials, no

sidewall samples could be collected, and unknown amounts of contaminated soils beneath Martin Way were not removed. When these remedial activities and pipe installation were concluded, the area was backfilled to grade.

The source of the contamination was not identified, but appeared to be historical. There are no currently known fuel storage facilities located in the immediate area of this site.

An initial investigation was completed in November of 2006 by the Thurston County Health Department, which recommended the site be listed on Ecology's "Confirmed or Suspected Contaminated Sites List". This was eventually followed by an Early Notice Letter sent from Ecology to the City of Lacey stating that the initial investigation had indicated that further testing and possible cleanup of this site is needed.

Summary of Soil Sample Results						
Sample ID	**Date Analyzed**	**Analysis/Lab**	**Sample Location**	**Diesel (mg/kg)**	**Heavy Oil (mg/kg)**	**Mineral Oil (mg/kg)**
1	8/17/2005	NWTPH-Dx GeoTechnical Testing Labortory	Stock Pile	1100	-	-
SP-1	8/17/2005	NWTPH-Dx/Dx by ESN Northwest	Stock Pile	140	nd	nd
SP-2	8/17/2005	NWTPH-Dx/Dx by ESN Northwest	Stock Pile	570	nd	nd
SP-3	8/17/2005	NWTPH-Dx/Dx by ESN Northwest	Stock Pile	330	nd	nd
SSW	8/31/2005	NWTPH-Dx/Dx by ESN Northwest	Excavated soils placed directly into dump trucks	7800	1200	nd
FS-12	9/1/2005	NWTPH-Dx/Dx by ESN Northwest	Excavation bottom, 12 feet bgs, eastern side	nd	nd	nd
FS-13	9/1/2005	NWTPH-Dx/Dx by ESN Northwest	Excavation bottom, 13 feet bgs, western end	nd	nd	nd

Image 1: Aerial photo of contaminated site and surrounding areas.

CONCLUSION:

During a sewer improvement project, petroleum contaminated soils were encountered, and test results confirmed the presence of TPH-D in the soils. 176 tons of contaminated soils were removed and disposed of properly. Confirmation samples confirmed that the floor of the pit had reached clean excavation limits. However, due to the presence of the road, trench boxes, and shoring materials, no side walls could be sampled and the lateral extent of this contamination could not be confirmed. No groundwater was encountered or tested, and the source of the contamination was not identified.

SPECIAL CONSIDERATIONS:

Due to the contamination documented on-site being primarily subsurface, the surface water and air routes are not applicable for WARM scoring for this site.

ROUTE SCORES:

Surface Water/Human Health:	**NS**	Surface Water/Environmental:	**NS**
Air/Human Health:	**NS**	Air/Environmental:	**NS**
Groundwater/Human Health:	**26.4 52.5 → 5**		

Overall Rank: **2**

WORKSHEET 2
Route Documentation

1. SURFACE WATER ROUTE – NOT SCORED

a. List those substances to be considered for scoring: Source:

b. Explain basis for choice of substance(s) to be used in scoring.

c. List those management units to be considered for scoring: Source:

d. Explain basis for choice of unit to be used in scoring:

2. AIR ROUTE – NOT SCORED

a. List those substances to be considered for scoring: Source:

b. Explain basis for choice of substance(s) to be used in scoring:

c. List those management units to be considered for scoring: Source:

d. Explain basis for choice of unit to be used in scoring:

3. GROUNDWATER ROUTE

a. List those substances to be considered for scoring: Source: 1, 2, 8

Sample results confirmed the detectable presence of TPH-Diesel and TPH-Oil in the soils on site. According to Table 830-1 from the MTCA Cleanup Regulations, there may also benzene, toluene, ethyl benzene, xylenes, cPAHs, naphthalenes, and PCBs associated with TPH-Diesel and TPH-Oil, which were never tested for.

b. Explain basis for choice of substance(s) to be used in scoring:

The following confirmed/suspected contaminates result in the highest site ranking: benzene and xylene (mixed).

c. List those management units to be considered for scoring: Source: 1, 2, 8

Soil contamination and groundwater contamination. (Contaminated soil, groundwater due to spillage or leakage from a source that has not been identified)

d. Explain basis for choice of unit to be used in scoring:

Soil contamination was confirmed through lab analysis. Ground water was never sampled.

WORKSHEET 6
Groundwater Route

1.0 SUBSTANCE CHARACTERISTICS

1.1 HUMAN TOXICITY

	Substance	Drinking Water Standard (µg/L)	Value	Acute Toxicity (mg/ kg-bw)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
								WOE	PF*	
1	Benzene	5	8	3306 (rat)	3	ND	-	A	0.029 *1.0= 0.029	5
2	Xylene (mixed)	10000	2	50 (human)	10	2	1	ND	ND	-

* *Potency Factor, ND-No Data*

Source: 1, 2
Highest Value: 5
(Max = 10)
Plus 2 Bonus Points? Yes
Final Toxicity Value: 12
(Max = 12)

1.2 MOBILITY (USE NUMBERS TO REFER TO ABOVE LISTED SUBSTANCES)

Cations/Anions [Coefficient of Aqueous Migration (K)]	Solubility (mg/L)
1=	**1** = 1800 = 3 (Benzene)
2=	**2** = 200 = 2 (Xylene, mixed)

Source: 1, 2
Value: 3
(Max = 3)

1.3 SUBSTANCE QUANTITY (VOLUME):

Explain basis: Unknown, smallest amount assumed (1 gallon).	Source: 1, 2 **Value: 1** (Max=10)

2.0 MIGRATION POTENTIAL

2.1	**Containment (explain basis):** No liner (3), unmaintained cover (1), no leachate system (2), possible free liquids (1)	2, 8, 9, 10	**7** (Max = 10)
2.2	**Net precipitation:** November – April average total precipitation: 38.58", November – April average evapotranspiration rate: 5.33", 38.58" – 5.33" = 33.25"	2, 3, 4	**4** (Max = 5)
2.3	**Subsurface hydraulic conductivity:** Soils include "very gravelly sandy loam, silt loam, and fine sandy loam"	2, 5	**3** (Max = 4)
2.4	**Vertical depth to groundwater:** Local WSDOT Resource Protection wells appear to average 20 feet deep.	2, 6, 7	**8** (Max = 8)

3.0 TARGETS

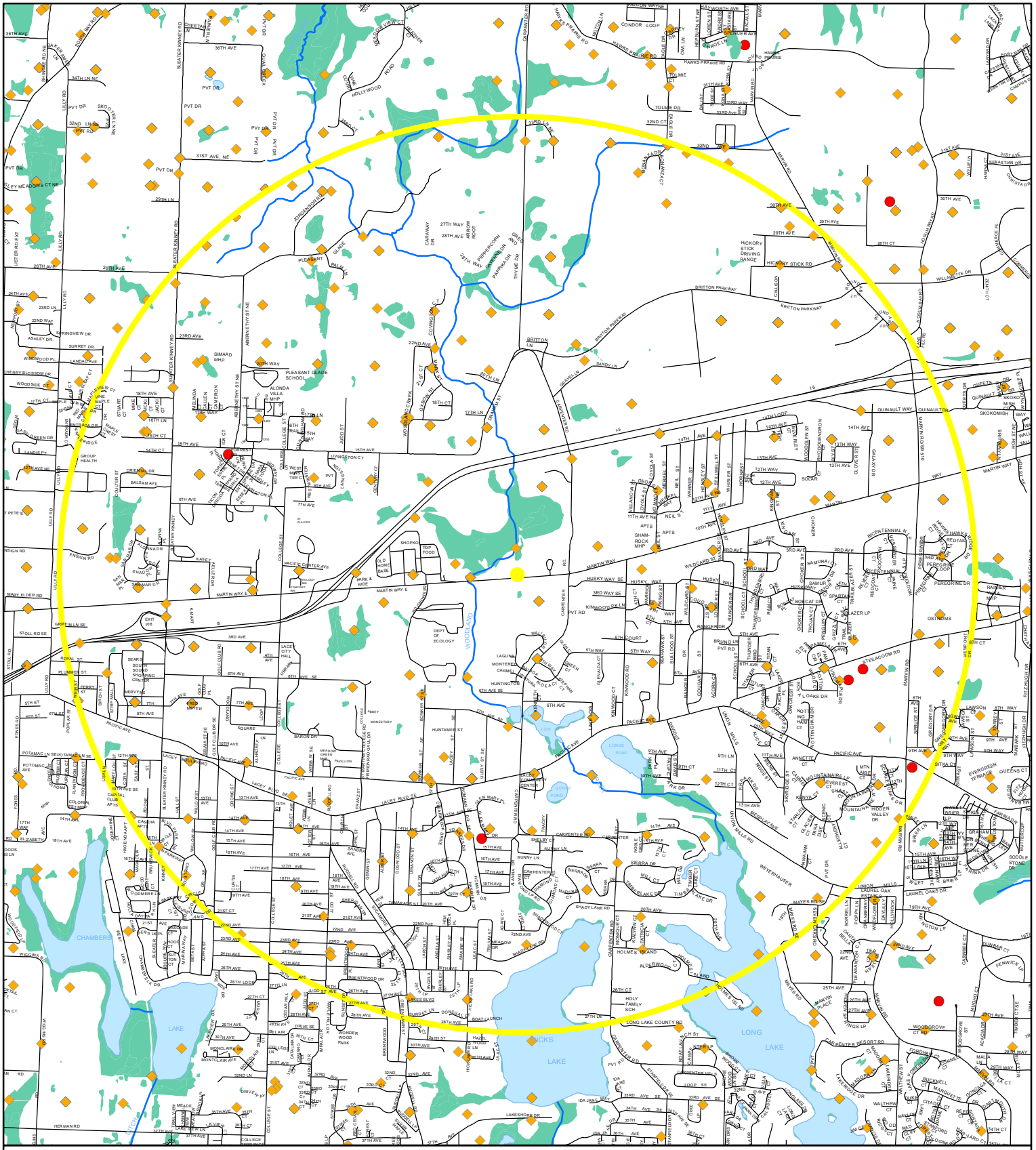
3.1	**Groundwater usage:** Private supply, but alternate sources available with minimum hookup requirements.	2, 5	**4** (Max = 10)
3.2	**Distance to nearest drinking water well:** Well located at the Nisqually Trout Farm, roughly 500 feet north of the site.	2, 5	**5** (Max = 5)
3.3	**Population served within 2 miles: √ pop. =** public water supply (74,317 people served, including the Lacey Water Department Well) + 524 houses on private well*3 people/well = 75,889 people >10,000 people = 100.	2, 6, 7	**100** (Max = 100)
3.4	**Area irrigated by (groundwater) wells within 2 miles:** $0.75\sqrt{}$(538 acres irrigated)= 17.4	2, 6, 7	**18** (Max = 50)

4.0 RELEASE

	Source	Value
Explain basis for scoring a release to groundwater: No confirmed release to groundwater.	2, 8	**0** (Max = 5)

SOURCES

1. Washington Department of Ecology, *Toxicology Database for Use in Washington Ranking Method Scoring*, January 1992.
2. Washington Department of Ecology, *WARM Scoring Manual*, April 1992.
3. Western Regional Climate Center, Precipitation data from the Olympia, Washington Airport, June 1948 to September 2005.
4. Thurston County Environmental Monitoring, Thurston County Courthouse West Olympia, All data from 2009-2014, December 2014.
5. Thurston County Geodata Center, Roads and Transportation Division, October 2013.
6. Washington State Department of Health, Drinking Water Division, Sentry Database, November 2012.
7. Washington Department of Ecology, Water Resources Program, Water Right Tracking System (WRTS), October 2012.
8. Sulewski, Brad. Thurston County, Initial Investigation Field Report: ERTS#550092 LOTT Construction Project, Martin Way, November 29, 2006.
9. GeoTechnical Testing Laboratory, Re: Soil Testing For Diesel Fuel, Project: Between Desmond and Carpenter on Martin Way, Report Date: 8/17/2005
10. Stemen Environmental, Inc. Re: Transportation and Proper Off-Site Disposal of Petroleum East Martin Way Lacey, Washington. November 16, 2005.
11. Washington Department of Ecology, RE: Early Notice Letter Regarding the Release of Hazardous Substances at the LOTT Construction project ROW Martin Way E Letter to City of Lacey, Dennis Ritter, March 1, 2010.
12. Washington Department of Ecology, ERTS# 550092 LOTT Construction Project, August 19, 2005.



- Site Location
- Radius Boundary
- Wetland
- Sensitive Species & Habitats
- Well
- Stream
- Roads

THURSTON COUNTY

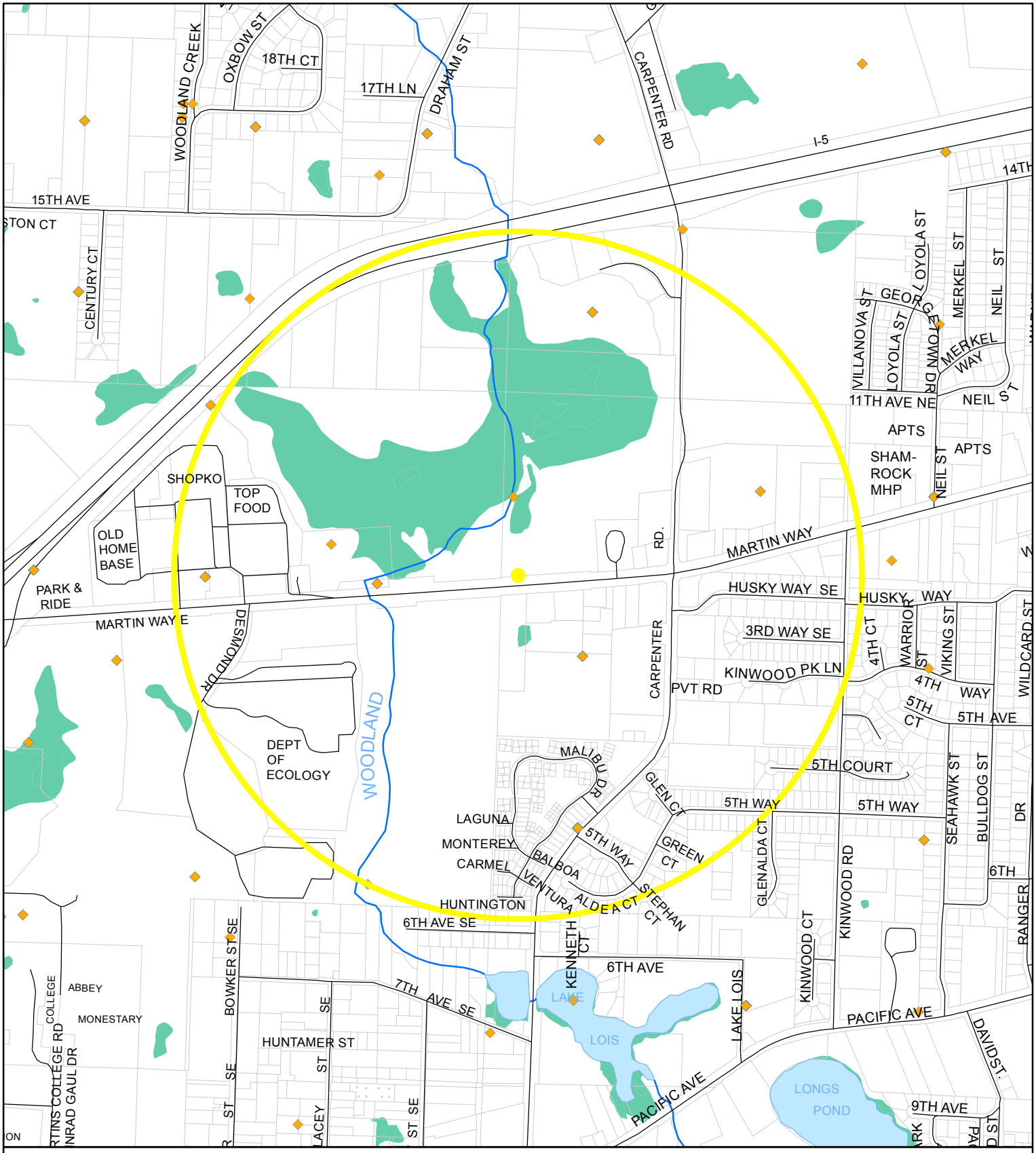
LOTT CONSTRUCTION PROJECT ROW
Ecology FSID# 16611
Two Mile Radius Analysis

2010 US Census Population within Radius: 31,277

0 0.25 0.5 1 Miles

Thurston GeoData Center

Map Created on 5/4/2015 kah



- Site Location
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- Roads

THURSTON COUNTY

LOTT CONSTRUCTION PROJECT ROW
Ecology FSID# 16611
Half Mile Radius Analysis

2010 US Census Population within Radius: 1,917

0 0.125 0.25 0.5 Miles

Thurston GeoData Center

Map Created on 5/4/2015 kah